MULTIPLE CHOICE

1. In government data, a household consists of all occupants of a dwelling unit. Choose an American household at random and count the number of people it contains. Here is the assignment of probabilities for your outcome:

Number of persons	1	2	3	4	5	6	7
Probability	0.25	0.32	???	???	0.07	0.03	0.01

The probability of finding 3 people in a household is the same as the probability of finding 4 people. These probabilities are marked ??? in the table of the distribution. The probability that a household contains 3 people must be

(a) 0.68 (b) 0.32 (c) 0.16 (d) 0.08 (e) between 0 and 1, and we can say no more.

2. Which of the following statements about a table of random digits is **true**?

(a) If each line contains 40 digits, there will be exactly 4 zeros in every line.
(b) The probability that there are exactly 4 zeros in a line of 40 digits is exactly 0.5.
(c) The number of zeros in a line of 40 digits will vary, but on the average there will be 4 zeros per line.
(d) There can never be 4 zeros in a row because that pattern isn't random.
(e) Both (c) and (d) are true.

3. A friend rolls cheap dice many times. He reports that the probabilities of the possible outcomes are about as follows:

Outcome	1	2	3	4	5	6
Probability	0.2	0.2	0.2	0.1	0.1	0.2

Is this a legitimate probability model?

(a) Yes.
(b) No -- the faces must all have the same probability.
(c) No -- the 3 and 4 faces are opposite each other, so they must have the same probability.
(d) No -- the total probability for all faces is wrong.
(e) No -- not all the values given are possible values for a probability.

Choose an American household at random and ask how many cars and trucks that household owns. Here are the probabilities as of 1997:

Number of vehicles	0	1	2	3	4	5
Probability	0.04	0.25	0.45	0.18	0.06	0.02

4. This is a legitimate assignment of probabilities because it satisfies these rules:

(a) all the probabilities are between 0 and 1.
(b) all the probabilities are between -1 and 1.
(c) the sum of all the probabilities is exactly 1.
(d) Both (a) and (c).
(e) Both (b) and (c).

5. What is the probability that a randomly chosen household owns more than one motor vehicle?

(a) 0.96 (b) 0.71 (c) 0.26 (d) 0.25

9. If I toss a fair coin five times and the outcomes are TTTTT, then the probability that tails appears on the next toss is

(a) 0.5 (b) less than 0.5 (c) greater than 0.5 (d) 0 (e) 1

10. If a coin has 0.6 probability coming up tails, the probability that it comes up heads is

(a) 0.5 (b) -0.2 (c) 0.4 (d) 0.6 (e) 1.0

12. The probability that the sum is 7 when you roll two dice is 1/6; the probability that the sum is 11 is 1/18. Suppose you play a game where you win if the sum is 7 or 11. What is the probability that you win?
(a) 2/6 (b) 2/18 (c) 7/6 (d) 2/9 (e) 2/24

13. If I toss a fair coin 5000 times
(a) the number of heads will be close to 2500
(b) the proportion of heads will be close to 0.5 BOTH (A) and (B)
(c) the price of oranges will increase
(d) the proportion of heads in these tosses is a parameter
(e) the proportion of heads will be close to 50

20. A household is a group of people living together at the same address. Choose one American household at random and record how many people it contains. Here are the probabilities:

Number of people	1	2	3	4	5	6	7 or more
Probability	?	0.32	0.17	0.16	0.07	0.02	0.01

What is the probability that the household chosen contains only one person?
(a) 0.15 (b) 0.25 (c) 0.35 (d) 0.75 (e) Can't tell from the information given.

21. What is the probability that a randomly chosen household contains 4 or more people?
(a) 0.10 (b) 0.16 (c) 0.26 (d) 0.90 (e) Can't tell from the information given.

22. A poker player is dealt poor hands for several hours. He decides to bet heavily on the last hand of the evening on the grounds that after many bad hands he is due for a winner.
(a) He's right, because the winnings have to average out.
(b) He's wrong, because successive deals are independent of each other.
(c) He's right, because successive deals are independent of each other.
(d) He's wrong, because his expected winnings are $0 and he's below that now.

6. In government data, a family consists of two or more persons who live together and are related by blood or marriage. Choose an American family at random and count the number of people it contains. Here is the assignment of probabilities for your outcome:

Number of persons	2	3	4	5	6	7
Probability	0.42	0.23	0.21	0.09	0.03	0.02

What is the probability that the family you choose has more than 2 people?
(a) 0.35 (b) 0.42 (c) 0.58 (d) 1.00 (e) Between 0 and 1, and we can say no more.

7. Using the probabilities in the previous question, what is the expected size of the family you draw?
(a) 2 people (b) 3 people (c) 3.14 people (d) 3.5 people (e) 4.5 people

10. A gambler who keeps placing $1 bets on roulette will, after a very large number of bets, find that his average winnings per bet are close to $0.947. (The house keeps the other $0.053 per bet.) The statistical term for the number $0.947 is
(a) the probability of winning a bet (b) the bias of a bet (c) a random # (d) the expected value of a bet.

12. You play a game with two possible outcomes. Outcome A has probability 0.4 and outcome B has probability 0.6. When B occurs you win $2.00; otherwise, you lose $1.00. What is your expected value for this game?
(a) $2.00 (b) -$0.10 (c) $0.20 (d) -$0.80 (e) $0.80